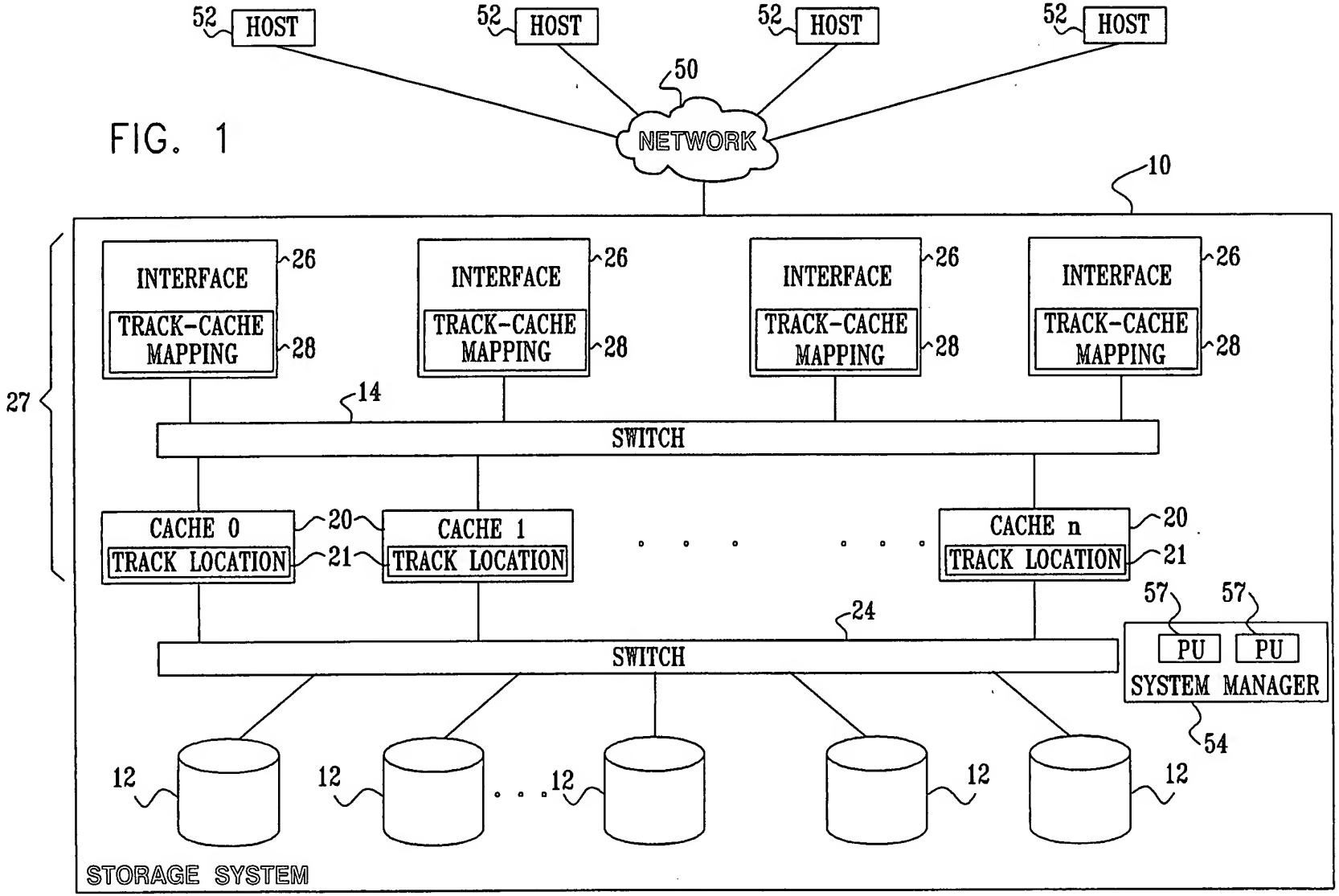
FIG. 1


52
HOST
52
HOST
52
HOST
52
HOST
50
NETWORK
10
27
INTERFACE
26
TRACK-CACHE MAPPING
28
INTERFACE
26
TRACK-CACHE MAPPING
28
INTERFACE
26
TRACK-CACHE MAPPING
28
INTERFACE
26
TRACK-CACHE MAPPING
28
14
SWITCH
CACHE 0
20
TRACK LOCATION
21
CACHE 1
TRACK LOCATION
CACHE n
20
TRACK LOCATION
21
24
SWITCH
57
57
PU
PU
SYSTEM MANAGER
54
12
12
12
12
12
STORAGE SYSTEM

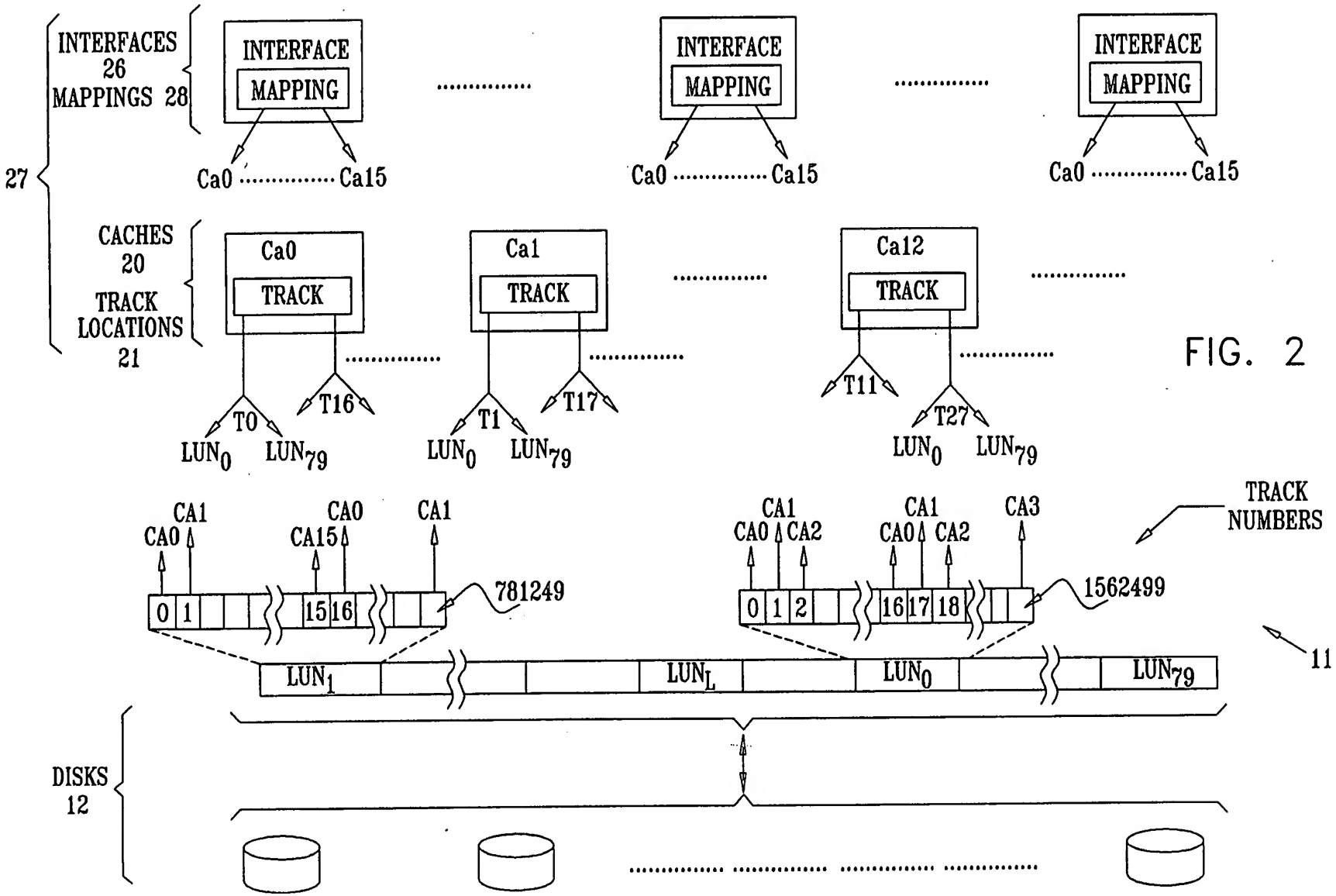
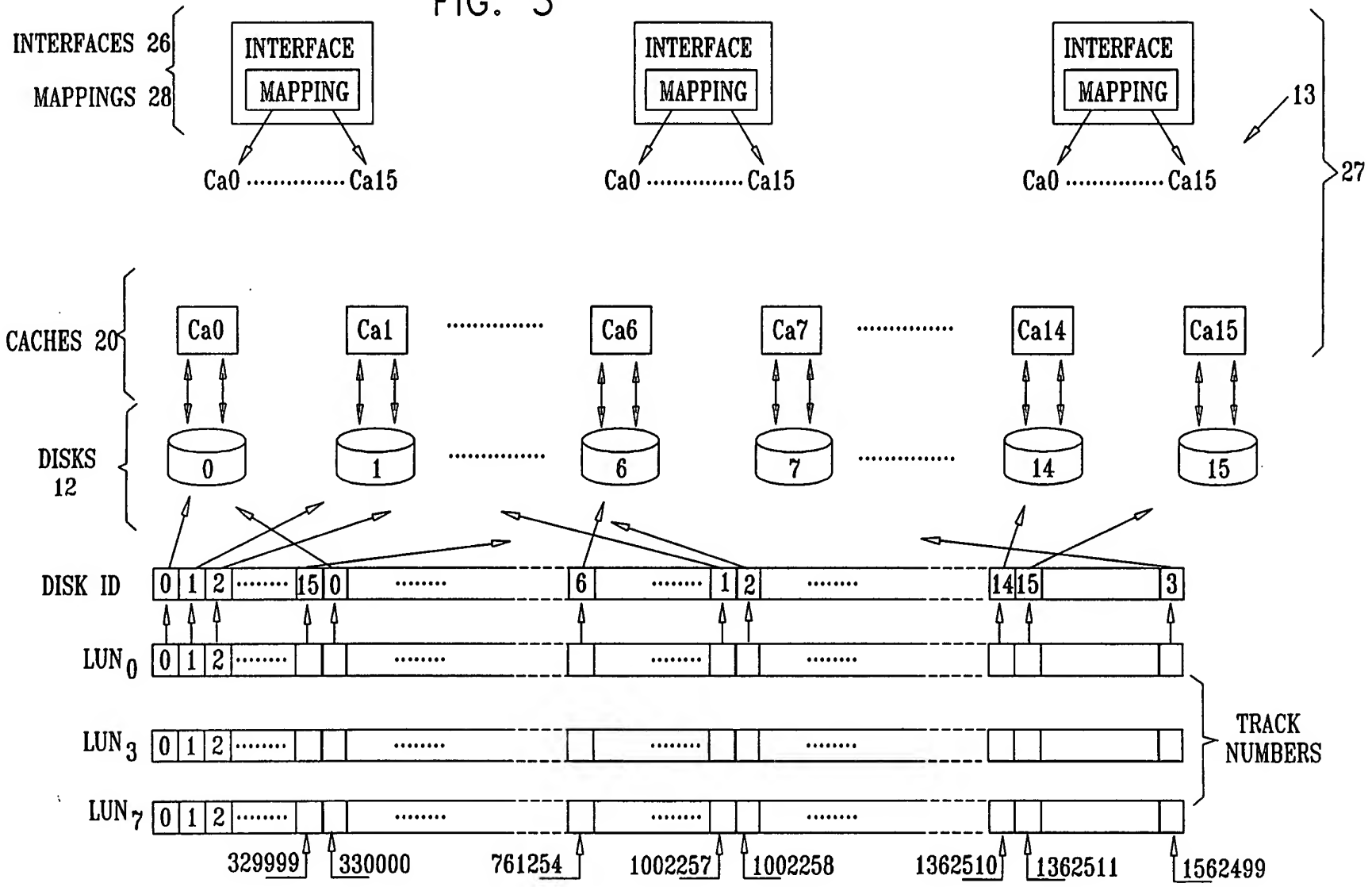

INTERFACES
26
MAPPINGS 28
27
INTERFACE
MAPPING
Ca0
Ca15
CACHES
20
TRACK
LOCATIONS
21
Ca0
Ca1
Ca12
TRACK
T0
T16
T1
T17
T11
T27
LUN0
LUN79
CA1
CA0
CA15
781249
CA2
CA3
1562499
TRACK
NUMBERS
LUN1
LUNL
11
DISKS
12

FIG. 2

FIG. 3


INTERFACES 26
MAPPINGS 28
INTERFACE
MAPPING
Ca0 ..... Ca15
13
27
CACHES 20
Ca0
Ca1
Ca6
Ca7
Ca14
Ca15
DISKS 12
0
1
6
7
14
15
DISK ID
LUN 0
LUN 3
LUN 7
TRACK NUMBERS
329999
330000
761254
1002257
1002258
1362510
1362511
1562499

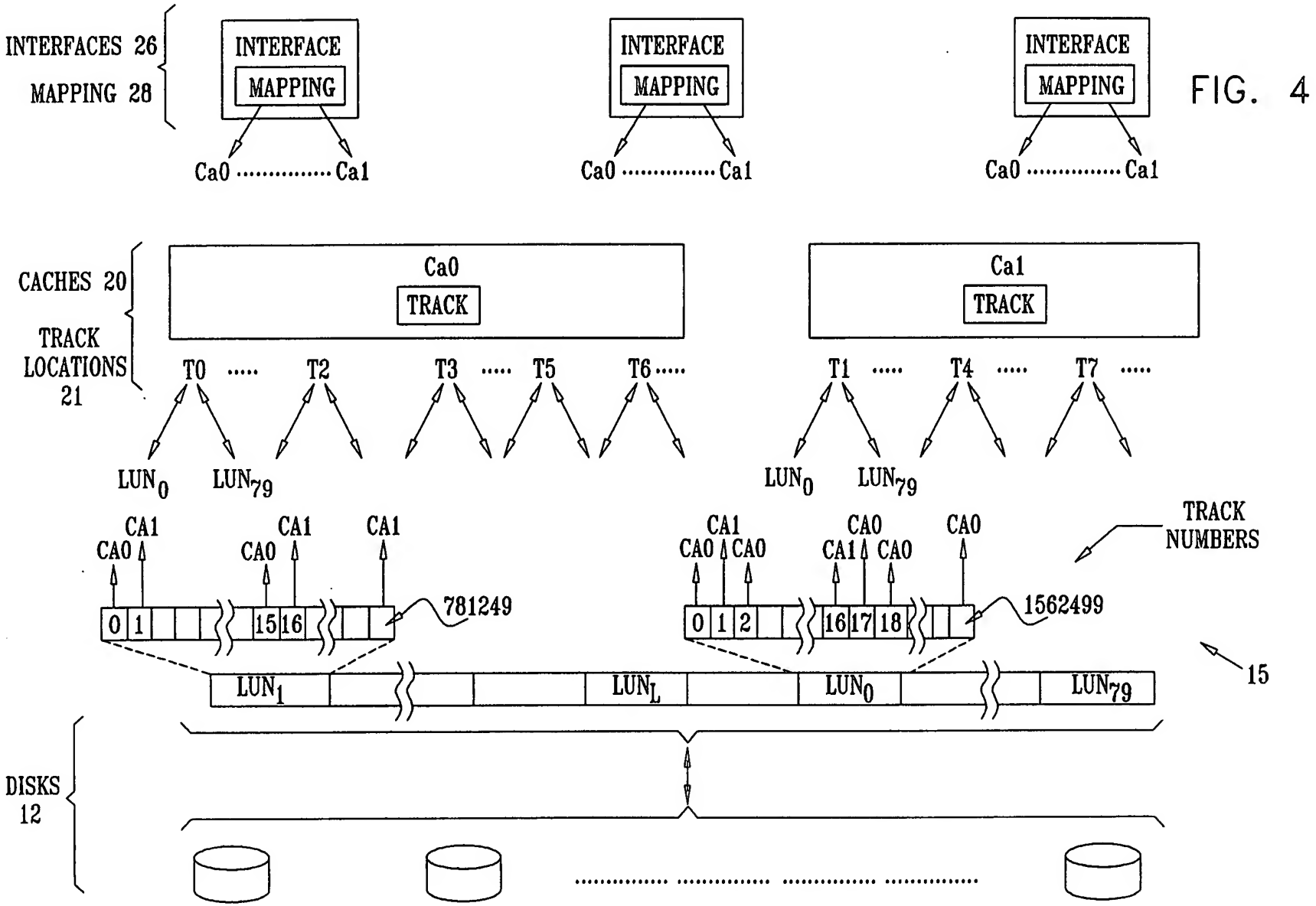

INTERFACES 26
MAPPING 28
INTERFACE
MAPPING
Ca0
Ca1
CACHES 20
TRACK LOCATIONS 21
TRACK
T0
T1
T2
T3
T4
T5
T6
T7
LUN0
LUN79
CA1
CA0
TRACK NUMBERS
781249
1562499
LUN1
LUNL
15
DISKS 12

FIG. 4

FIG. 5

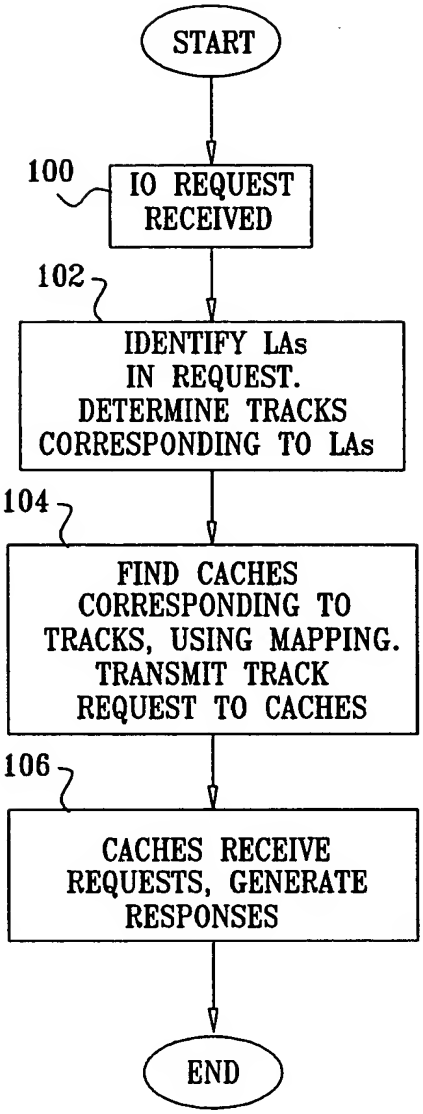

START
100
IO REQUEST RECEIVED
102
IDENTIFY LAs IN REQUEST. DETERMINE TRACKS CORRESPONDING TO LAs
104
FIND CACHES CORRESPONDING TO TRACKS, USING MAPPING. TRANSMIT TRACK REQUEST TO CACHES
106
CACHES RECEIVE REQUESTS, GENERATE RESPONSES
END

FIG. 6

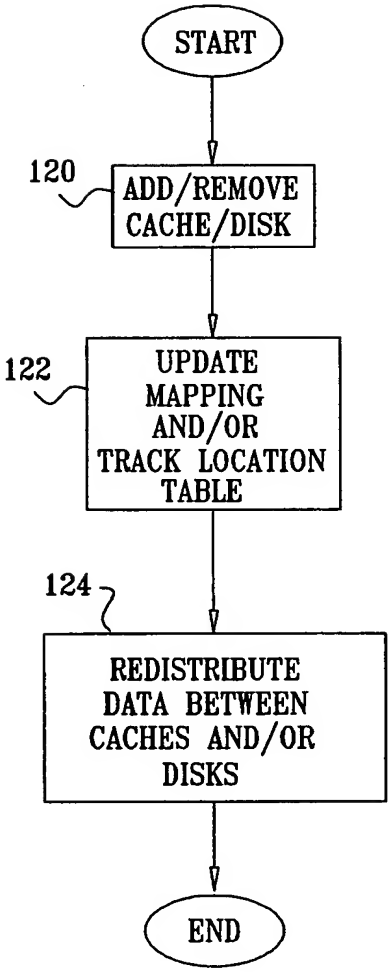

START
120
ADD/REMOVE CACHE/DISK
122
UPDATE MAPPING AND/OR TRACK LOCATION TABLE
124
REDISTRIBUTE DATA BETWEEN CACHES AND/OR DISKS
END

FIG. 7

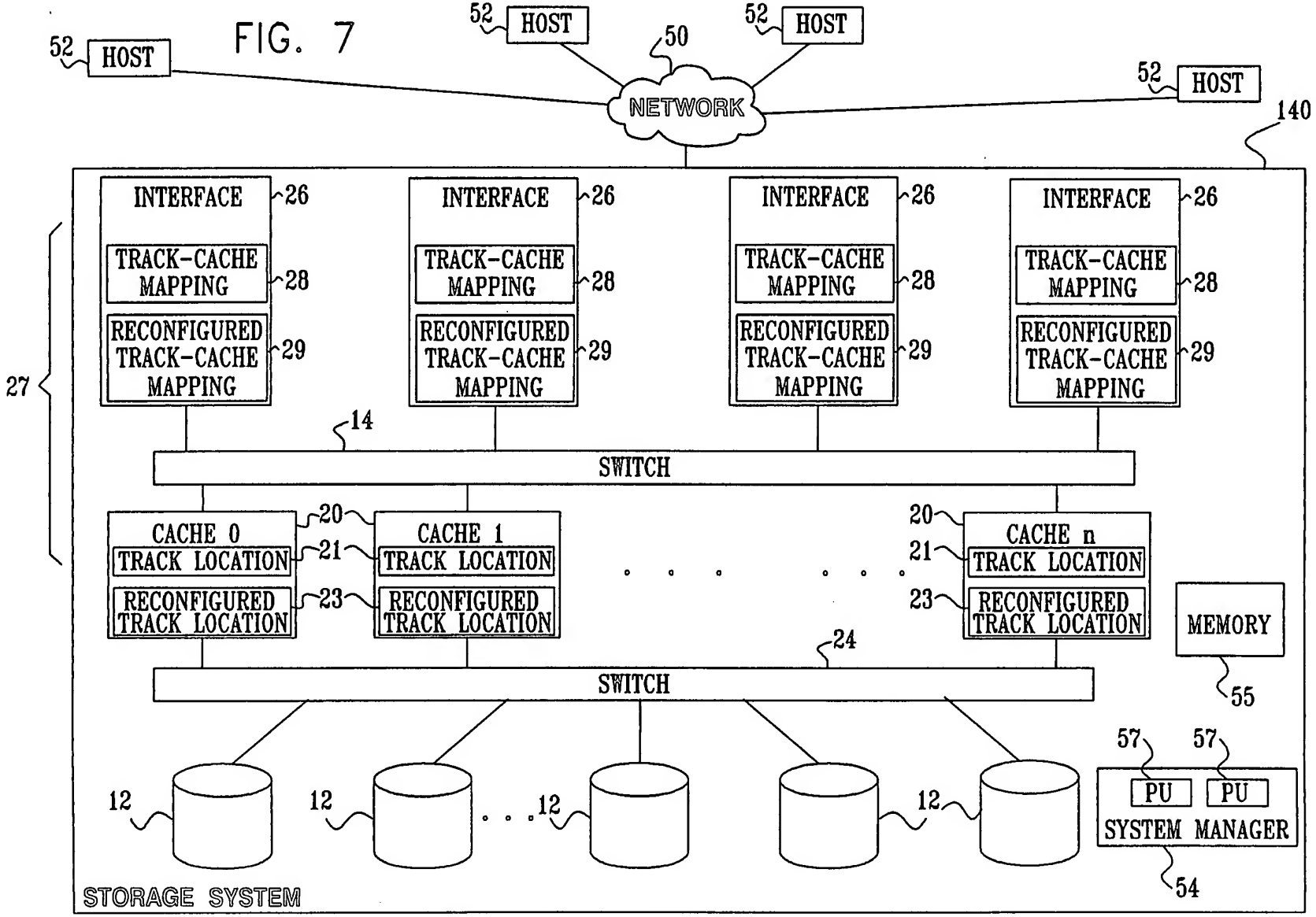

52
HOST
52
HOST
52
HOST
52
HOST
50
NETWORK
140
27
INTERFACE
26
TRACK-CACHE MAPPING
28
RECONFIGURED TRACK-CACHE MAPPING
29
14
SWITCH
CACHE 0
20
TRACK LOCATION
21
RECONFIGURED TRACK LOCATION
23
CACHE 1
CACHE n
MEMORY
55
24
SWITCH
12
57
PU
SYSTEM MANAGER
54
STORAGE SYSTEM

FIG. 8

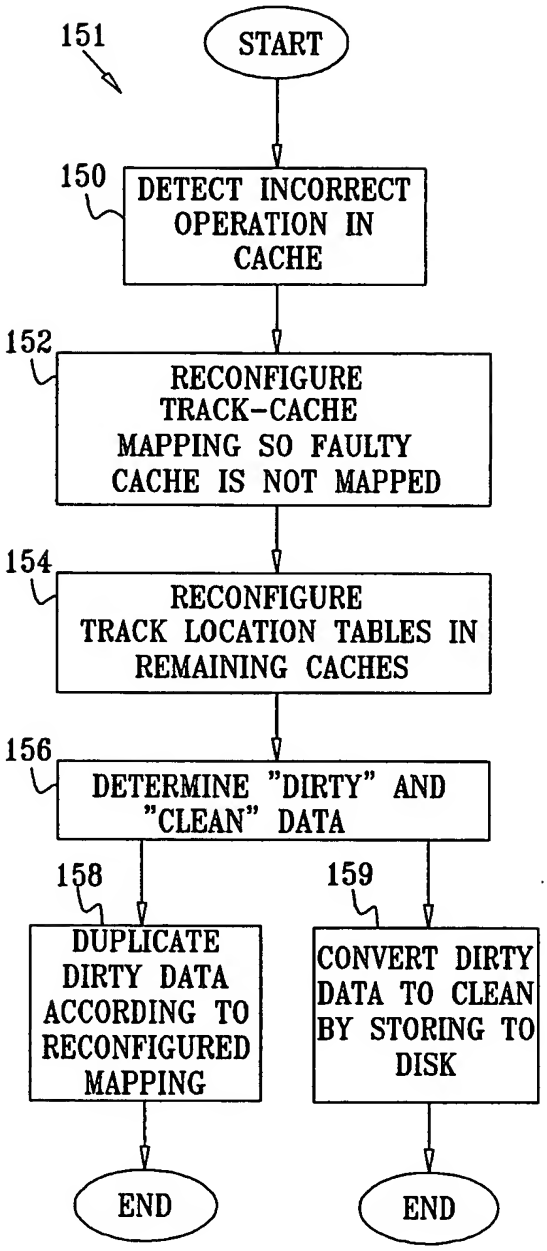
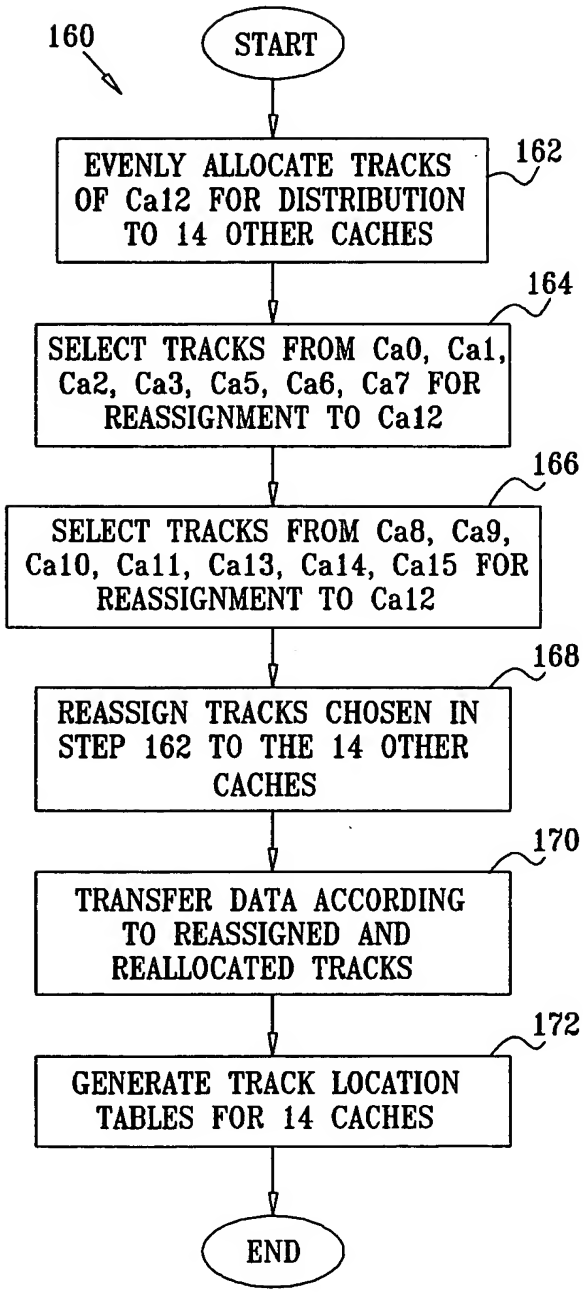

151
START
150
DETECT INCORRECT OPERATION IN CACHE
152
RECONFIGURE TRACK-CACHE MAPPING SO FAULTY CACHE IS NOT MAPPED
154
RECONFIGURE TRACK LOCATION TABLES IN REMAINING CACHES
156
DETERMINE "DIRTY" AND "CLEAN" DATA
158
DUPLICATE DIRTY DATA ACCORDING TO RECONFIGURED MAPPING
159
CONVERT DIRTY DATA TO CLEAN BY STORING TO DISK
END
END

FIG. 9


160
START
EVENLY ALLOCATE TRACKS OF Ca12 FOR DISTRIBUTION TO 14 OTHER CACHES
162
164
SELECT TRACKS FROM Ca0, Ca1, Ca2, Ca3, Ca5, Ca6, Ca7 FOR REASSIGNMENT TO Ca12
166
SELECT TRACKS FROM Ca8, Ca9, Ca10, Ca11, Ca13, Ca14, Ca15 FOR REASSIGNMENT TO Ca12
168
REASSIGN TRACKS CHOSEN IN STEP 162 TO THE 14 OTHER CACHES
170
TRANSFER DATA ACCORDING TO REASSIGNED AND REALLOCATED TRACKS
172
GENERATE TRACK LOCATION TABLES FOR 14 CACHES
END